

REMARKS

Applicants respectfully request consideration of the subject application. This Response is submitted in response to the Office Action mailed October 24, 2006. Claims 1-5, 7, 9-13, 15-23, 25-29, 31-35, 42-43 and 45-46 are pending. Claims 1-5, 7, 9-13, 15-23, 25-29, 31-35, 42-43 and 45-46 are rejected. In this Amendment, claims 1 and 42 have been amended. No new matter has been added.

35 U.S.C. §103 Rejections

Claims 1-2, 4-5, 7, 9-13, 15-22, 25-29, 42-43, and 45-46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Downing in view of Mittal, et al. (U.S. Patent No. 4,450,505, hereinafter "Mittal"), claims 10 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Downing in view of Mittal as applied to claims 1 and 29 above, and further in view of Yamamoto, et al. (U.S. Patent No. 4,729,060, hereinafter "Yamamoto"), Claims 32-35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Downing in view of Mittal as applied to claims 1 and 29 above, and further in view of Hisano, et al. (U.S. Patent No. 5,198,889, hereinafter "Hisano").

Downing is directed to a coolant-activated high-intensity cooler for cooling electronic modules. Downing discloses hollow resilient members mounted at the open end of a coolant chamber and having bellows and a heat

transfer piece mounted at the ends of the bellows so as to be in direct and resilient contact with electronic components. Downing also discloses a laminated stack of plates arranged with a metal bellows. Downing further discloses that fluid coolant flows through the stack and the metal bellows expand when the coolant is initially pressure to move the cooler assembly into contact with the electronic module which acts as the heat source. When the coolant circuit is depressurized, the spring constant in the bellows will cause the assembly to retract from the module allowing servicing or replacement.

Mittal is directed to a multichip thermal conduction module that has improved cooling in a housing. The housing is divided so as to form first and second cooling portions. The chips are in the first cooling portion and several bellows extend into the first cooling portion so that each bellows is urged into deflecting contact with a respective chip.

Downing does not teach or suggest a flexible channel being conformable with an integrated circuit disposed at an angle relative to the open end of the flexible channel. Downing discloses that the thermally conductive interface elastomer material interfaces between the bellows and the module so that any surface irregularities on the module or misalignment between the assembly and module are accommodated without impeding the transfer of heat.

Similarly, Mittal does not teach or suggest a flexible channel being conformable with a non-planar integrated circuit. Mittal specifically discloses: "Board 16 is well known and includes a plurality of integrated circuit chips 30 mounted thereon having a substantially planar surface 32." (Col. 2, lines 31-33). Mittal also discloses: "Chips 30 have their planar surface 32 extending into first cooling portion 36." (Col. 2, lines 42-43). Thus, Mittal specifically teaches away from embodiments of the presently claimed invention. As shown in Mittal and explained in Mittal at col. 2, lines 23-45, the integrated circuit is placed into a housing assembly such that the integrated circuit is planar (i.e., not disposed at an angle).

The Examiner submits that that "Downing definitely discloses having a spring-restoring force" based on comments in the previously submitted Amendment. Applicants note that Downing discloses two different bellows (bellows 17 and bellows 20 in Figures 1 and 2), each bellows having different characteristics. Applicants disagree with the Examiner's characterization of Downing and Applicant's remarks.

The Examiner also submits that Downing inherently discloses a device that can conform to an integrated circuit disposed at an angle. Applicants respectfully disagree.

Downing is directed to a system wherein a conduit is connected to the bellows member and plate stack to cool the device. In addition, Downing includes a stack of plates disposed within the bellows. The stack of plates needs to be in planar contact with the metal end cap to effectively transfer heat.

Moreover, Downing at col. 2, lines 17-23, indicates that it is disadvantageous to have "a single bellows provided per cooling device." Downing also discloses at col. 3, lines 42-49, surface irregularities or misalignments between the cooling device and the heat source are accommodated by an elastic contact pad or a thermally conductive elastomer. Accordingly, Downing teaches away from embodiments of the present invention.

In contrast, in embodiments of the presently claimed invention, the flexible channel is conformable with integrated circuits disposed at an angle relative to the open end of the flexible channel.

Neither Yamamoto nor Hisano disclose a flexible channel that is conformable with integrated circuits disposed at an angle relative to the open end of the flexible channel.

Therefore, neither Downing, Mittal, Yamamoto, Hisano, nor combinations thereof disclose or suggest the claimed limitations of independent claims 1 and 42. Claims 2-5, 7, 9-13, 15-23, 25-29, 31-35, 43, 45 and 46 depend, directly or

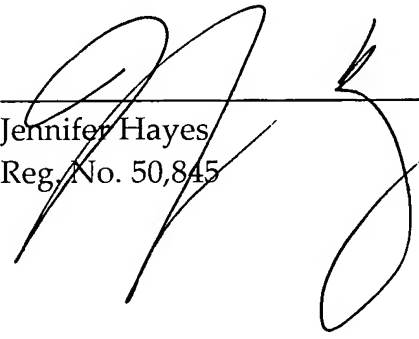
indirectly, from one of the foregoing independent claims. Applicants,
accordingly, respectfully request withdrawal of the rejections under 35 U.S.C. §103.

Applicants respectfully submit that the present application is in condition
for allowance. If the Examiner believes a telephone conference would expedite
or assist in the allowance of the present application, the Examiner is invited to
call Jennifer Hayes at (408) 720-8300.

Please charge any shortages and credit any overages to Deposit Account
No. 02-2666. Any necessary extension of time for response not already requested
is hereby requested. Please charge any corresponding fee to Deposit Account
No. 02-2666.

Respectfully submitted,
Blakely, Sokoloff, Taylor & Zafman LLP

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Jennifer Hayes
Reg. No. 50,845

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, California 90025-1026
(408) 720-8300